ENERGY SERVICES
BULLETIN
The energy and planning resource for Western utilities
NOVEMBER 2014

SRP SURPASSES ENERGY-EFFICIENCY GOALS, HEADS FOR SUSTAINABILITY

Salt River Project exceeded its annual goal of helping residential and commercial customers save energy and money through the Phoenix, Arizona-based utility's energy-efficiency programs and initiatives.

Last year, SRP's energy-efficiency programs for both residential and commercial customers provided annual energy savings equal to 2.3 percent of SRP's retail energy sales. The Fiscal Year 2014 program goal was 1.5 percent of retail sales, so saving 640 million kilowatt-hours—the equivalent annual energy use of 35,000 homes—is quite an accomplishment.

"The energy-efficiency goal is part of our longer term Sustainable Portfolio Objective," explained Dan Dreiling, SRP director of Market Research and Customer Programs. "SRP established an objective to meet 20 percent of our expected retail energy requirements with sustainable resources by 2020. Sustainable resources include energy efficiency, hydroelectric generation and other renewable generation."

Retail lighting programs, both commercial and residential, provided SRP with its biggest energy savings. (Photo by Salt River Project)

Energy efficiency is proving to be not only the most cost-effective way for SRP to help customers save energy and money, but also the sustainable resource with the most potential. The largest savings came from the Retail Lighting Program, which offered customers discounted prices on LED and CFL light bulbs. Reduced prices, which SRP provides to several big box retailers and home center stores, drove annual customer purchases to more than 2 million lamps.

Dreiling attributes the program's considerable success to partnering with large, recognizable retailers, offering a diverse product mix and

See ENERGY-EFFICIENCY GOALS, page 2

WHAT'S INSIDE

Energy-efficiency goals

from page 1

providing meaningful discounts on popular products. An effective multi-channel marketing campaign helped to spread the word to a relatively young energy-efficiency marketplace.

COOLING AND MORE

Other high-performing programs that contributed to the goal include appliance recycling, Energy Star New Homes and rebates for Energy Star-certified, variable-speed pool pumps and, of course, efficient air conditioners. SRP offers substantial rebates for air conditioners and heat pumps with a seasonal energy efficiency ratio, or SEER, of 15 or higher.

The air conditioner rebate was so attractive that one energy-savvy SRP customer couldn't resist. "Since I work in Energy Services, I am very aware of our home energy use," said Western Public Utilities Specialist Patricia Weeks. "For the last several years, we have been watching our utility bills increase, and I suspected that our two 20-year-old, heating-and-cooling units were to blame."

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ENERGY SERVICES
Western Area Power Administration

Weeks purchased two energy-efficient systems that qualified for the SRP rebate last winter. "Our home is more comfortable and our utility bill is averaging $24 less per month compared to last year," she stated.

Residential customers also increased their comfort and savings with comprehensive home assessments and rebates for services and products such as home duct repair and window shade screens. "In terms of motivation," Dreiling observed, "we have learned that increasing comfort and convenience is just as important to customers as saving money on their utility bill."

FOR 'BOTTOM LINERS'

Lighting was the source of most of SRP's commercial energy savings. Enhanced lighting rebates through Standard Business Solutions, large commercial and industry energy-efficiency projects through Custom Business Solutions and lighting retrofit projects under the Small Business Solutions program collectively saved nearly 179,000 MWhs of energy.

Fry's Food Stores, a Phoenix supermarket chain, participated in the SRP Business Solutions rebate programs to implement 50 projects in 30 metropolitan stores. So far, the grocery retailer has realized about 1.2 million kWh per year in energy savings. "SRP rebate programs help Fry's continue to reduce our carbon footprint, which is good for the environment as well as our bottom line," said Ben Tan, energy manager of Fry's Food Stores Facilities Engineering.

Dreiling acknowledged that reaching commercial customers with efficiency programs is a challenge for SRP, as it is for so many utilities. "But we are seeing more and more customers moving in this direction," he noted. "It comes down to demonstrating that efficiency is a value proposition, not only for the organization, but its customers, as well."

The best advertisement for business efficiency programs is a success story like Fry's Food Stores, he added.

UP NEXT

Perhaps the biggest challenge an energy-efficiency program faces after a successful year is how to build on that success.

While the popular lighting program will continue, SRP plans to put more emphasis on its residential whole-house program in the coming year. Comprehensive solutions for the entire home have a higher price tag than energy-efficient light bulbs, but produce deeper energy savings for the homeowner. "We will continue to offer specific air conditioner-related savings measures, as well," said Dreiling. "In Arizona, air conditioning is a primary energy consumer so managing that load is key to deferring future resource needs."

Thanks to commitment and savvy energy planning, SRP seems well prepared for the future. The timetable for meeting its goal of 20 percent sustainable resources by 2020 is already ahead of schedule. Almost 13 percent of its retail energy needs currently come from wind, geothermal, solar, landfill gas, biomass and hydropower, as well as energy-efficiency programs. In balancing reliability, affordability and environmental stewardship, SRP is proving that energy efficiency tips the scale toward success.

CITY OF PALO ALTO UTILITIES AWARDED PUBLIC POWER UTILITY OF THE YEAR

Palo Alto's municipal utility takes solar energy mainstream in drive for 100% carbon-free electric supply

The Solar Electric Power Association (SEPA), an educational nonprofit organization that helps utilities integrate solar electric power into their energy portfolios, has named the City of Palo Alto Utilities (CPAU) as Public Power Utility of the Year. The award was announced on Oct. 21 at the Solar Power International conference in Las Vegas.

Julia Hamm, president and CEO of SEPA, praised the municipal utility for "walking the talk" of community focus, and pointed to CPAU's customer-friendly menu of solar services and tariffs. "The agency has demonstrated innovation and pragmatism in leveraging affordable solar to meet its goal of becoming a carbon-free utility," Hamm stated.

Founded in 2005, SEPA's annual awards recognize organizations and individuals advancing utility innovation, industry collaboration and leadership in the solar energy sector.

Palo Alto Mayor Nancy Shepherd called the award a tremendous honor for the city. "We continually strive to be on the cutting edge of environmental sustainability," said Mayor Shepherd. "This award recognizes how public and private partnerships, along with forward-thinking community support for renewable energy, can allow cities to successfully reduce their carbon footprint."

ROAD TO CARBON NEUTRALITY

The 2014 award recognizes the City of Palo Alto Utilities for its leadership and innovation in demonstrating solar energy's viability as a mainstream power source. The utility has continuously increased the size of its solar electric portfolio. A recent power purchase agreement puts the city on track to have a 100-percent carbon-free electric supply portfolio by the year 2017. The city implemented a 100-percent carbon-neutral electric policy in 2013, purchasing energy from renewable sources, as well as purchasing renewable energy certificates to offset "brown" market power resources.

Most recently, The Palo Alto City Council approved a plan to encourage local solar generation, with options for community and group buys for customers who want to support solar energy but cannot install a solar system on their own property. With the Local Solar Program strategy, the utility aims to increase the local solar installations from 5 Megawatts (MW) at the end of 2013 to 23 MW by 2023.

The utility also offers customers a full set of solar services and incentives, including residential and commercial rebate programs, expedited permit processing, green power purchase premium options, workshops, one-on-one advice and coordination with industry representatives. A feed-in-tariff CPAU established in 2012 provides third parties with the opportunity to install solar arrays on local businesses and sell the energy back to the utility.

Western congratulates the City of Palo Alto on its award, and on its progress toward a carbon-neutral power supply. Energy Services is available to help all Western customers meet their planning and sustainability goals. Contact Energy Service Manager Ron Horstman or your regional Energy Services representative for more information.

WORKSHOP FOCUSES ON IMPROVING IRRIGATION EFFICIENCY

Inefficient irrigation systems can be costly—to the grower, the utility and the community—so Western is co-sponsoring a workshop Nov. 18 to help agricultural customers explore resources to tackle the problem.

Irrigation accounted for 99 percent of NPPD's reported peak load controlled in 2010.

LOTS TO LEARN

REAP Irrigation Energy Cost Savings—From Testing Your Pumps to Financing and Completing the Project will introduce participants to free equipment-testing programs, grants and incentives to upgrade their agricultural operations. Speakers from Nebraska Public Power District (NPPD) and Department of Agriculture (USDA) Rural Development will share:

- Details on free programs support through NPPD, Western and other agencies
- Hands-on training on pump testing and using infrared cameras to identify savings on energy-related costs, such as livestock watering, grain drying and shop energy
- Information on the USDA Rural Energy for America Program application process and NPPD efficiency and load management incentives

Best of all, the workshop is free to NPPD members and their agricultural customers. "We are excited about this workshop because it offers a unique perspective," explained NPPD Energy Efficiency Consultant Ronald Rose. "Irrigation customers will learn about the types of projects that qualify for federal, state and local incentives, and how to design energy efficiency into their projects up front."

HEAR FROM EXPERTS

NPPD is a leader in managing irrigation loads and supporting agricultural customers. Over the past 40 years, connected irrigation horsepower served by NPPD has grown at an annual rate of 4.7 percent. Irrigation accounted for 99 percent of reported peak load controlled in 2010. The power wholesaler's EnergyWise Pump Efficiency Program offers financial incentives for testing and upgrading eligible electric irrigation pumps to improve overall efficiency.

NPPD recently partnered with a grower and vendor on an innovative pilot project, and Rose will be on hand to discuss lessons learned. The 25-kilowatt solar-powered irrigation system comprising 100 250-watt panels generated 40,000 kilowatt-hours in its first year of operation. "As far as we know, the system is the first of its kind in Nebraska," he observed.

Visitors to NPPD's website will find an operating-cost calculator and a status window to check on the daily irrigation control schedule. There is also information about specialized rates, incentives and applying for USDA energy grants.

USDA Rural Development provides from $22.8 to $75 million in grant funding to agricultural producers and small rural business owners interested in improving their energy efficiency or investing in renewable resource technology. The nationwide program is available to businesses in populations of 50,000 or less and to farmers and ranchers.

VETERAN TRAINING PROVIDER

Clean Energy Ambassadors (CEA), which is coordinating the event, has teamed with Western on many successful workshops, including popular infrared camera training. CEA's free Lunchtime Webinar series presents a monthly opportunity to learn about cost-effective measures and technologies that can help small electric cooperatives save their customers energy and money.

Registration is required, so don't wait to take advantage of this training opportunity. After registering you will receive an agenda and directions to the workshop site, the NRD Conference Center in Grand Island, Nebraska. For more information about registration or the workshop, contact Emily Stark at 406-969-1040.

RENEWABLE ENERGY PROGRAM REPORT: WIND KEEPS BLOWING, GROWING

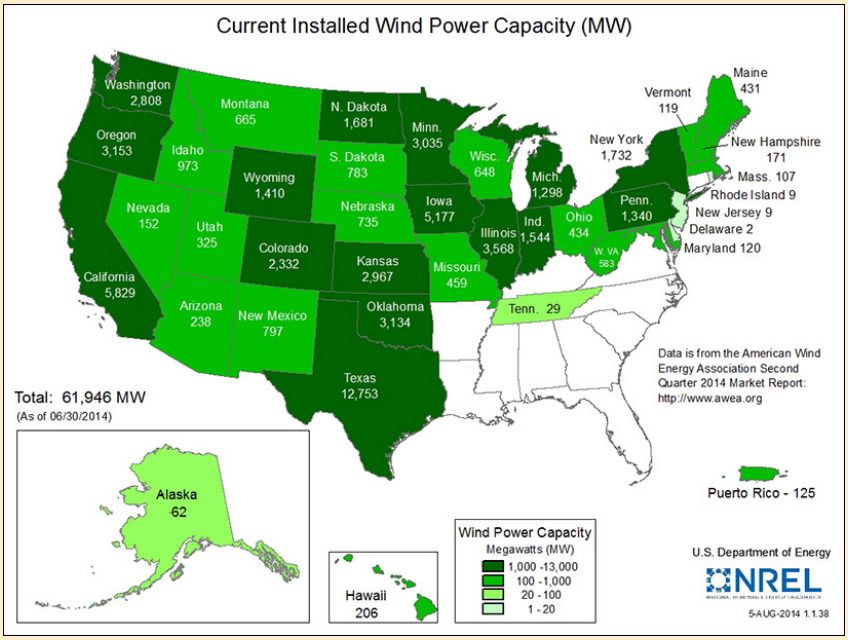
EDITOR'S NOTE: This story is the first in a series of overviews of the different types of renewable resources and how they fit into the generation mix.

Western's Renewable Energy Program is dedicated to helping our customers diversify their resource portfolios by providing information and technical assistance to evaluate their options. No single resource or mix works for every power provider, and even if two different utilities choose the same resource, each will gain different benefits and face different challenges. That being said, there is one renewable that leads the pack: wind.

Second only to hydropower in installed capacity, wind represents 27 percent of the nation's renewable generation and supplies 4 percent of our total electricity. According to the Energy Information Administration (EIA) wind's share of the nation's electric power portfolio has increased 121 percent over the last three years, and is expected to continue as the fastest growing form of generation.

There are now 61,327 megawatts (MW) of installed wind capacity in the United States and more than 46,000 wind turbines. Installed capacity in Western's territory alone totals more than 26,000 MW and includes the second- and third-largest wind producing states, California and Iowa respectively.

The top 10 rural electric cooperatives with wind capacity on their system are all generation and transmission cooperatives, including several Western customers. Basin Electric Power Cooperative placed first in 2012, with 716 MW of total wind capacity, and Great River Energy earned the number three spot on the list with 474 MW. Their successful wind programs have earned both utilities the Wind Cooperative of the Year award.



Many of the states leading the nation in wind capacity are located within Western's territory. (Artwork by National Renewable Energy Laboratory)

A STANDOUT RESOURCE

Some of the advantages wind power boasts are common to other types of renewables—low greenhouse gas emissions, free domestic fuel supply, local job creation—while others are unique to the resource. One feature of wind that does not get enough attention is that it uses far less water than many other types of generation. Water consumption per megawatt-hour for wind is almost zero (solar or dry-cooling gas plants are similar), compared to around 1,000 gallons for coal, oil or concentrating solar power with recirculating cooling.

Cost is another factor that sets wind apart from other resources. It is one of the lowest-priced renewable energy technologies available, costing between two and six cents per kilowatt-hour, depending upon the wind resource and project financing and ownership structure of the particular project. Wind also offers economic development opportunities for rural areas. Growers can lease their land for turbines and still produce crops and livestock, since the towers have a relatively small footprint.

NOTHING'S PERFECT

Like all forms of energy, both renewable and nonrenewable, wind has its share of challenges as well as benefits that each utility must assess based on individual circumstances.

Intermittency is the concern that most readily comes to mind for the average consumer, and it is certainly true that wind does not blow all the time. More accurate weather forecasting programs, affordable utility-scale storage and a more flexible grid would

See RENEWABLE ENERGY PROGRAM REPORT, page 6

go a long way toward addressing the issue. Many research programs at national laboratories and universities are focusing on developing new technologies and improving existing systems to integrate wind onto the grid.

In the meantime, the utility industry is accustomed to dealing with the inherently variable nature of the power system. Those operational strategies are applied to wind, allowing the grid to balance constantly changing demand needs, whether the generation is coal, gas or wind. Some utilities are using demand response—cycling controlled loads on and off during peak demand—to match the load to the generation. Controlled super-insulated electric water heaters can use off-peak wind generation to heat water overnight and store it for use the next day. Plug-in electric vehicles may one day offer another load that can "bank" wind power.

In any case, the more wind we place on the system, the more complicated it becomes to balance load with resources cost effectively. Western and the industry are working hard to address these issues.

Perhaps a greater challenge to wind development is that many areas with the best resources are located far from the load. The American Recovery and Reinvestment Act of 2009 gave Western borrowing authority for transmission projects intended to connect renewable energy facilities to load demand. The Transmission Infrastructure Program (TIP) is currently partnering on several projects with at least one geographical point in Western's territory.

NOT A PROBLEM

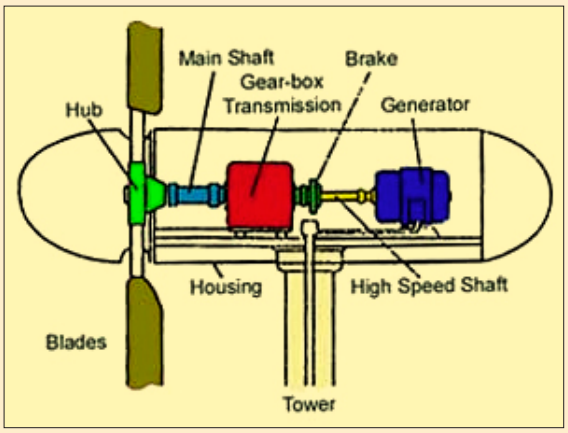
Along with real challenges, wind is beset by several misconceptions that are ripe for a little myth-busting.

The belief that wind turbines are unusually harmful to birds is a persistent myth that scientific studies do not support. Most research indicates that urban sprawl, buildings, house cats and the climatic changes are bigger threats to bird habitats. The National Audubon Society has stated its strong support for wind power as a clean alternative energy source that reduces the threat of global warming.

Noise pollution, likewise, is a concern, but credible peer-reviewed scientific data and various government reports have not shown links between wind turbine noise and negative health impacts. Some opponents of wind power have pointed to infrasound, or sound below the threshold of human hearing, as a hazard. However, researchers at the University of Massachusetts found no credible evidence of physiological or psychological effects resulting from exposure to low-level noise.

To put turbine noise in context, at a distance of 300 meters, the turbine will have the sound pressure of 43 decibels. The average air conditioner can reach 50 decibels of noise, and most refrigerators run at around 40 decibels. For a person living half a mile from a wind turbine, the noise would blend in with other background noise, and a mile away, no noise would be heard.

None of these facts are intended to imply that wind power has no environmental impacts—all forms of generation do. However, renewable energy is at a stage where the technologies are rapidly evolving to become safer and more efficient. As the industry grows, so does its knowledge of the impacts and the ability to mitigate them.



(Artwork by the California Energy Commission)

A SHORT EXPLANATION

The generator that turns wind into electricity is the wind turbine (not windmill), and it looks and acts something like a large toy pinwheel. Blowing wind spins the blades on the turbine. The blades are attached to a hub that is mounted on a turning shaft. The shaft goes through a gear transmission box that increases the turning speed. The transmission is attached to a high-speed shaft that turns a generator that makes electricity. In case of very high winds, the turbine has a brake to keep the blades from turning too fast and being damaged.

A FINAL WORD

Renewable resources are not a "one-size-fits-all" answer to energy independence. The purpose of Western's Renewable Resource and Energy Services programs is to help our customers determine what resources are right for their needs.

Just a few factors that affect a utility's choice include geographical location, state regulations and mandates, energy prices in the area and the makeup of its customer base. To learn more about renewable resources, contact Program Manager Randy Manion. For assistance with long-range portfolio planning, contact Energy Services Manager Ron Horstman or your regional Energy Services representative.

TECHNOLOGY SPOTLIGHT:

THE POWER OF NON-ENERGY BENEFITS

Most energy-saving technologies are invisible to users, but for some technologies, non-energy benefits (NEB) can be the deciding factor in getting consumers to spring for that energy-efficient new appliance or system.

NEBs are those "warm fuzzies" that keep customers happy—things like improved productivity, comfort, safety, health, process control or resale value. Commercial customers who do not excited about cutting energy costs or saving the environment might light up when they learn that a technology could reduce inventory, address regulatory concerns or cut down on maintenance. Especially for projects that don't have a quick direct payback, NEBs can make the business case to move forward.

The E3TNW database of new and emerging efficiency technologies, co-sponsored by Western and Bonneville Power Administration, has a field just for NEBs. Because these benefits often influence purchasers more than the energy cost savings, they can have a big impact on how quickly and deeply a new technology is adopted.

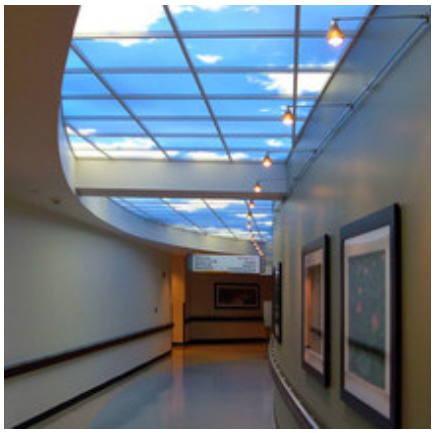
BEYOND EFFICIENCY

One example is interior storm windows, which can cut window energy losses by a quarter or more. These cost-effective alternatives to window replacement are available as easily installed Plexiglas models for homes and double-pane, aluminum-frame models for commercial buildings. They can cut cold drafts and raise the temperature of the interior pane, reduce outside noise and reduce condensation that can cause mold and damage window frames. Some come with solar-controlling tints and UV filters to reduce glare, heat gain and fabric fading. Homeowners who want to be more comfortable and protect their furnishings might see the energy-efficiency performance as just icing on the cake.

Interior storm window panels not only reduce energy loss, they protect furnishings and cut down on outside noise. (Photo by Emerging Energy Efficiency Technologies Database)

LED lighting is another technology that can almost sell itself on NEBs alone. The lamps are four to six times more efficient than incandescent lamps and last about 50 times as long, a point to mention to customers with critical lighting in hard-to-reach places. Unlike metal halide or high-pressure sodium lamps, LEDs, or light-emitting diodes, can be dimmed to save additional energy in areas where daylighting may occasionally be sufficient for the task. Warehouse managers might appreciate how easily the lighting can be automated and programmed for "just in time" use—turning on and off only when occupants enter the space—without needing a warm-up period to reach full intensity. The lamps perform much better than fluorescent lamps in cold temperatures, don't contain mercury and can change color as needed to support plant growth and intangibles such as workers' mood and productivity.

Speaking of mood, innovative products like the Sky LED Panel can liven up dreary spaces without putting an expensive and leaky hole in the building envelope. The office light fixture has images on the lens, such as clouds, that make the panel look like a skylight. Imagine the boost that could give to people in a hospital waiting room or drab office cubicle.



The Sky LED panel is an affordable and energy-efficient alternative to installing a skylight. (Photo by Smart Lighting Solution)

The Philips Hue lamp may be just the technology to get your early-adopter customers excited about LEDs. The color, brightness and timing of the lamp can be controlled remotely with a smart phone, a pretty cool app to show off to your tech-savvy friends.

LEARN MORE

Too many program managers focus entirely on energy savings and speak purely in engineering terms. Decisions makers, from homeowners to corporate CEOs, usually have other priorities more important to them. Western's Energy Experts hotline provides a resource for documentation and program ideas to help utility program managers figure out what their customers' priorities are and how energy-efficiency improvement projects can address them. Contact Energy Experts at 800-765-3756 or submit a technical question online, and don't forget to browse through Energy Solutions and Utility Options for inspiration.

BETTER BUILDINGS CHALLENGE DRIVES GREATER EFFICIENCY IN U.S. DATA CENTERS

A group of data center owners and operators has committed to reduce their energy use by at least 20 percent over the next decade through the Better Buildings Challenge. According to the Energy Department, data centers consumed about 100 billion kilowatt-hours of electricity in the U.S. last year, a number that is expected to grow.

In the first year, partners will share their results, report on the associated energy and cost savings, and develop an energy-metering plan, showcase project and implementation model. The Energy Department will make each company's data available on the Better Buildings Challenge website.

The 19 new partners joining the Better Buildings Challenge include four national laboratories—Argonne National Laboratory, Lawrence Berkeley National Laboratory, Los Alamos National Laboratory and the National Renewable Energy Laboratory. The Environmental Protection Agency, Department of Defense and Social Security Administration are among the federal agencies participating in the Challenge. Private industry partners include CoreSite Realty Corporation, eBay Inc., and Staples. These organizations are pledging to improve the efficiency of data centers, which altogether currently consume more than 90 megawatts of power.

As the data management and storage industry continues to grow, improving the energy efficiency of the buildings and operations will be critical to reducing the nation's carbon footprint. The Better Buildings Challenge supports the goal of doubling American energy productivity by 2030 by working with building owners across the business, industrial, residential, government and education sectors.

Currently, more than 200 Challenge partners have committed to improving the energy intensity of their building portfolios by at least 20 percent over 10 years. The program also provides a forum for matching partners and allies to enhance collaboration and problem solving in energy efficiency. Across the country, Better Buildings Challenge partners have completed upgrades to more than 9,000 facilities with 2,100 buildings improving efficiency by least 20 percent, and another 4,500 by at least 10 percent, compared to their baseline years.

REPORT: UTILITY-CONTRACTOR PARTNERSHIPS AFFECT SUCCESS OF ENERGY-EFFICIENCY PROGRAMS

Fast Water Heater Company has released a white paper suggesting that utility energy-efficiency programs built around strong cooperation between contractors and the power provider are likely to get more customer participation.

Approaches on Utility-Contractor Partnerships compared the experiences of two utilities marketing very similar rebates for an almost identical product over a similar time period. The major difference between the programs was the level of contractor engagement and accountability—and the results. A large utility serving 5 million customers used a conventional, partner-neutral business model with minimal contractor evaluation. The second utility, with 700,000 customers, actively collaborated with approved contractors on program promotion and follow-through.

The results, summarized in an article in Intelligent Utility, were strikingly different. The utility using the partnership model achieved a 63-percent penetration rate, in contrast to the 8-percent penetration rate of the program relying on the traditional approach.

The effect that the difference in the size of the utilities might have had on the results does not get much attention in the article, but may be explored in more depth in the report. Also, the report doesn't state whether the utilities are investor-owned or public power, which might reflect on the pre-existing relationships with their customers. Even so, the correlation between the partnership model and program success is worth noting.

The author, who is the CEO of Fast Water Heater subsidiary Demand Management Installation Services, addresses some of the reasons utilities prefer contractor neutrality, offering credible arguments for a more hands-on approach to energy-efficiency programs.

Studies like Approaches on *Utility-Contractor Partnerships* will be the focus of the Smart Cities conference, Nov. 3-5, in San Diego, California. Innovative utilities and industry leaders will be presenting case studies and hosting discussions on the future of the energy and water efficiency as well as municipal-level sustainability programs.